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UNIVERSITY OF ALBERTA
FACULTY OF AGRICULTURE

DUAL PURPOSE CATTLE

a Report of Five Years' Investigation with a Commercial Herd

By

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Faculty of Agriculture
University of Alberta
Edmonton, Alberta, Canada

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PREFACE

This bulletin reports the outcome of a five year experiment with a commercial herd of dual-purpose cows.

The experiment was planned with the object of determining the way in which such a herd might fit into a mixed farming program and at the same time obtaining information regarding financial returns secured from the sale of beef and dairy products.

The material presented in the body of the bulletin is based on the average performance of the herd. Details regarding the record of individual cows will be found in summary tables presented at the back of the bulletin.

It is hoped that those interested in utilizing cows of other than the strictly beef or dairy types will find this publication helpful.

Dual Purpose Cattle

A REPORT OF FIVE YEARS' INVESTIGATION WITH A COMMERCIAL HERD

By

J. P. SACKVILLE

Professor of Animal Science

The dual purpose cow is one which fits between the beef and dairy type. She has the ability to produce a reasonable flow of milk and at the same time produces a calf which when properly finished yields an acceptable carcass of beef. Cows of this type contributed in no small measure to the well-being as well as to the revenue of the farm people in the early days of agricultural settlement in the province of Alberta. Cows of the dual purpose type were brought into the province by the earlier settlers.

The pioneer farmer, operating with few neighbors and without any market worthy of the name, was primarily concerned with the problem of providing a living for himself and family. At the same time he had to utilize his limited farm output to the best possible advantage in an endeavor to obtain some means of exchange. The dual purpose cow did a good job in this connection. The family needs for dairy products and meat were assured. Surplus milk found a market in the form of butter, frequently manufactured at home and exchanged at the local store for additional necessities. Home killing of beef supplied the family table and the sale of the odd quarter of beef locally added still further to cash returns.

Experience shows that as the agricultural development of a country proceeds, coupled with an increase in demand and value of farm lands and the enlargement of markets both domestic and export for farm products, the trend is towards a more intensive type of farm production accompanied by more or less specialization.

When this has reached its fullest and logical development the farm production program takes on a more or less organized and permanent pattern. In this connection various fundamental factors come into play. Proper land utilization, recognition of the importance of soil conservation, economic markets that may be available, the background experience and inherited characteristics of the people concerned are all involved. In some sections of Alberta there is still a con-

dition of agricultural pioneering and only in a limited number of areas has the stage of reasonable stability been reached with respect to all that is related to a long-time agriculture program.

Possibility of a Dual Purpose Herd

Within the confines of the black and gray soil zones in Alberta, especially those areas beyond the fringes of what might be termed reasonably close settlement, it would appear that conditions are such as to suggest the maintenance of dual purpose cows. For the most part farm holdings consist of one quarter to three quarter sections. The need for a crop rotation in which pasture and hay occupy a fair share of the land in order to maintain the productive capacity of the soil is recognized. This in turn suggests the necessity of a live stock production program as a means of marketing forage crops. In this connection cattle of some kind occupy an important place.

An outlet for fluid milk may not be available but the local creameries in many cases offer a satisfactory market for cream. Specialized dairying with all that is involved in the way of labor and heavy capital investment in buildings, equipment and cows, does not appeal to certain farmers while they recognize that the sure and regular returns obtained from a herd of milking cows makes for security of farm income.

On the other hand, commercial beef production has its limitations. Cattle raising of this type is usually associated with relatively cheap land and inexpensive feeds. Ordinarily it is only under such conditions that one is justified in maintaining a cow for twelve months from which the only return is a weaned calf.

The number of inquiries which have been received within the past ten years seeking information with respect to the possibility of a cattle production program on the basis of combined milk and beef suggests that there is a substantial number of farmers in Alberta who are interested in dual purpose cows. With a view to meeting the demand for this information the Department of Animal Science, in 1941-42, established a herd of dual purpose cows at the University of Alberta.

Object of the Experiment

The object of this experiment was to make a careful and detailed study of the performance of this herd maintained under ordinary farm conditions for a five year period in order

to ascertain if possible what dual purpose cattle have to offer in the way of:

(1) Dairy Production.
(2) Beef Production when calves were sired by good beef bulls and raised on skim milk.
(3) Financial returns in terms of dairy products and beef.
(4) As a medium for marketing farm grown feeds with special emphasis on pasture and hay.

Animals Used

Two breeds—Shorthorn and Red Poll—are recognized as dual purpose cattle in Alberta. Both of these breeds were represented in the herd set up at the University. The object was to assemble as uniform a herd as possible and one that would be representative of the two breeds in question.

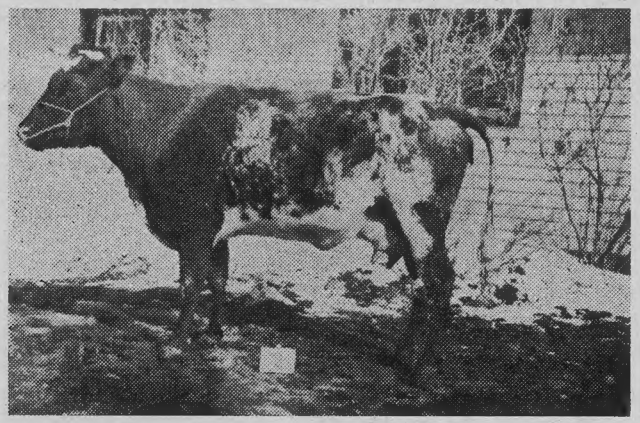

Fig. No. 1—Grade Shorthorn cow, No. 2. Average production for 4 lactation periods (average 322 days), 8,809 lbs. milk, 355.8 lbs. fat. Average gross yearly return, including value of beef prduced, $187.96.

In order that the herd might continue to function satisfactorily for a reasonable number of years it seemed desirable to choose young cows. In order that something might be known of their milking qualities it was decided that they should have completed at least one lactation period.

The Shorthorn herd originally included 12 cows—10 grades and 2 purebreds—3 and 4 years of age carrying their second calf. They were selected from a number of breeders in the Edmonton, Alix, Clive, Coronation and Sunnybrook districts in the province. The average purchase price on the entire group was $63.00 per head. They were all sired by pure-

bred Shorthorn bulls and in practically every case, bulls of strictly beef breeding, rather than of the dairy or dual purpose strain. It was true, however, that in most instances preference was given to those whose dams showed some evidence of reasonable milk production—good udders for example. The dams of the cows selected were with two exceptions the result of grading up with the use of Shorthorn bulls in whose ancestry milk production had been emphasized and from herds where hand milking had been practiced for a varying number of years.

The six Red Poll cows, all pure bred, were purchased from the following breeders in Alberta: Atkinson Brothers, St. Albert; T. Howes, Millet; H. L. Sweet, Morningside, and H. F. Wise, Galahad. The breeders in question generously allowed the pick of their herds at a price of $75.00 per head. The ages of the Red Poll cattle ranged from three to six years; all had produced at least one calf. They were backed by very respectable milk records and could be considered reasonably good specimens of the breed.

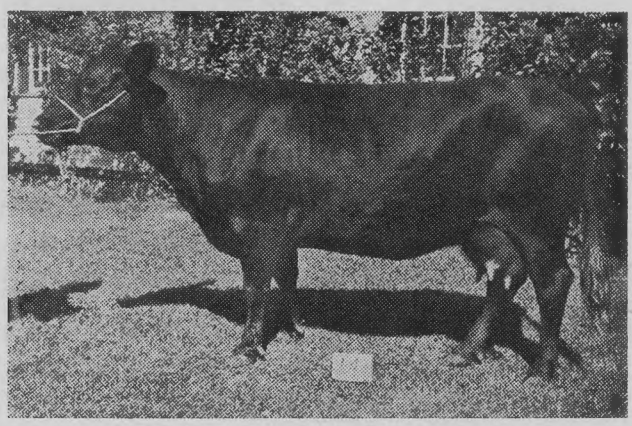

Fig. No. 2—Pure bred Red Poll cow, No. 14. Average production for 4 lactation periods (average 339 days), 7,070 lbs. milk, 314.9 lbs. fat. Average gross yearly return, including value of beef produced, $173.64.

Breeding Program

With the exception of 3 animals—1 Shorthorn and 2 Red Poll—all the cows either had calves at foot or were safe in calf when purchased. This meant that the date of calving was extended over several months. Following the first year an effort was made to have the cows freshen during the late winter and spring season—if possible within a period of three months—in order that the calves would be reasonably uniform

with respect to age. Another reason for having the herd freshen at this particular time of the year was that it made it possible to capitalize on pasture during the major part of the lactation period and further permitted of low cost of maintenance during the winter feeding period when the cows were dry.

In spite of careful selection some disappointments were experienced in the performance of a few of the animals that made up the original herd. Four Shorthorns failed, after a fair trial, to measure up from the standpoint of milk production and were sold for beef. Another of the same breed died within a year after taking delivery due to milk fever at the time of second calving. Three additional purchases were made to take the place of the four removals mentioned above; these brought the Shorthorn herd up to ten. One of the Shorthorns developed udder trouble in May 1944 and was sold while another from the same breed suffered the same ailment the following year and was likewise disposed of. This meant that during the fourth year of the experiment nine, and the last year eight, cows constituted this herd. The original six Red Poll cows were maintained throughout the five year trial.

The entire herd (both breeds) had passed a clean test for tuberculosis before taking delivery but it was not feasible to obtain a blood test for Bang's disease. The result was that there was a total of six abortions—3 Shorthorns and 3 Red Poll—during the five years the experiment was in progress. This not only reduced the annual calf crop but abortion was followed in some cases by difficulty in getting the cows to breed regularly. It also disturbed the sequence of calving which in turn meant that calves were born at irregular periods of the year and this defeated the aim of producing a uniform calf crop from the point of view of age.

The first calf crop involved in this experiment from both the Shorthorn and Red Poll cows were sired by purebred bulls of their respective breeds. The second and third year the cows (both breeds) were bred to a purebred Aberdeen Angus bull, Dalrene la Bard—60299—then in use in the purebred Aberdeen Angus herd at the University. He was quite an outstanding bull, both in individuality and breeding, showed plenty of size coupled with good fleshing qualities and proved to be a very satisfactory breeding sire. The fourth and fifth years the entire herd was mated with a Hereford bull, Rockmore—136236—head of the Hereford females in the University herd. He was equally as good a bull both in type and breeding as the Aberdeen Angus that had sired the two previous calf

crops. He had scale, smoothness, and fleshing, and did a good job in siring cross-bred calves.

Feeding and Management of the Breeding Herd

As has already been mentioned the plan was, so far as possible, to have calving take place from one to two months previous to turning on pasture around the latter part of May. Following freshening and until grass was available the cows were housed in the dairy barn and fed a ration consisting of equal parts oats and barley together with oat silage and a combination of alfalfa and oat hay (green feed). During the winter feeding period iodized salt as well as a calcium-phosphorus mineral mixture was also included. The grain allowance was based on the amount of milk produced, ordinarily at the rate of one pound of grain daily for each four pounds of 3.5% milk produced per day. Cows which continued milking following the grazing season or in those cases where they freshened in late summer or autumn were fed according to the same plan. While on pasture the milking cows received two pounds of grain per head daily, a barley and oats mixture. This practice was followed mainly in order to encourage them to find their proper stalls without too much confusion in the dairy barn at milking time. While in the barn water was available at all times from automatic water bowls. All cows were milked twice daily by a milking machine.

Reasonably good pasture was usually available by the latter part of May. This consisted of a mixture seeded at the rate of eight pounds of brome grass, four pounds of alfalfa and two pounds of yellow-blossom sweet clover per acre. This ordinarily provided satisfactory grazing until well along in August. At any time during the later summer or fall when pastures were insufficient to maintain a normal milk flow they were supplemented with dry feed including some grain. Access to other pasture, including cover crop, was frequently possible at this season. While on pasture water was available at all times from an open trough, and reasonable shelter was provided.

During the dry period the object was to carry the cows on as economical a ration as was possible, consistent with maintaining reasonable thrift and flesh. Pasture took care of this situation during the grazing season, while roughages, mixed hay—including alfalfa at times—oat silage, together with all the oat straw they would consume made up the ration in the winter. The dry cow herd was sheltered, for the most part, in a partially open straw shed where they had the run

of a yard. At other times they were housed in either the dairy or beef barn at night and out in the open yards practically every day. Water was offered at least once a day during the winter.

Feeding and Management of Calves up to 6-7 Months of Age

Calves were allowed to nurse their mothers for the first 48 hours following birth. This was to insure that they received colostrum milk. They were then fed whole milk from the pail until four weeks of age after which skim milk was gradually substituted until by the time they had reached six weeks of age they were receiving all skim milk. The rate of skim milk feeding was on the basis of 10 pounds daily per 100 pounds live weight until they were from six to seven months old when milk feeding was discontinued.

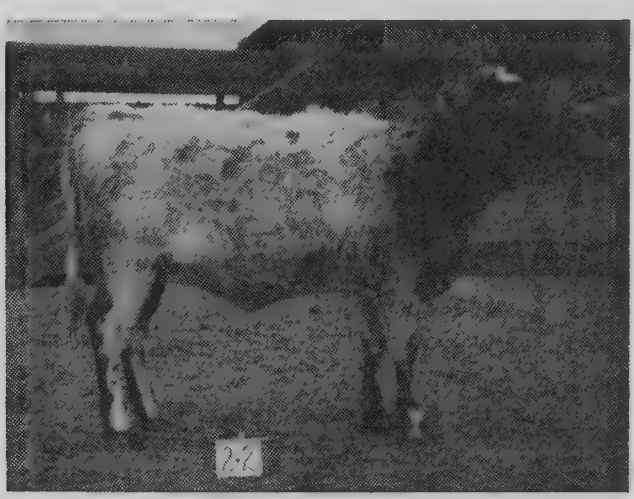

Fig. No. 3—Calf from cow No. 2 by Shorthorn sire. Photo taken following 7 months skim milk feeding at which time it weighed 455 lbs.

A grain mixture of coarsely ground oats together with 12% ground flax was self fed commencing when the calves were a few weeks old. When they reached the age of four months the grain mixture, still self fed, was changed to equal parts by weight of ground oats and barley and the proportion of flax was reduced to 8%. They were allowed all the good quality hay they would consume. The hay mixture varied from time to time but usually included a fair proportion of alfalfa. A mineral mixture of equal parts salt and bone meal or mono-calcium phosphate was available at all times. Water

was provided at least twice per day—more frequently during mid-summer. The young calves were kept in box stalls in the dairy barn but were allowed outside in sheltered yards during the day when weather conditions were favorable. As soon as pasture was available they had the run of a grass paddock for the remainder of the open season. During the extreme heat of midsummer when flies were bad they were sheltered in the barn in the hottest part of the day. Provision was made for fresh pasture (a mixture of oats and rye) commencing in the early fall. Individual weights were taken at birth followed by monthly weights until the calves were removed to the feed lot.

Feeding and Management of Calves Following Discontinuation of Milk Feeding

During the first two years of the experiment the calves were moved to dry feed lot at the time skim milk feeding was discontinued, with a view to finishing when approximately one year old. The grain mixture used at this time (hand fed twice a day) was equal parts ground oats and barley (by weight) and 10% ground flax. Hay consisted of equal parts of cut alfalfa and oat hay. A mineral mixture made up of salt 50%, bone meal or monocalcium phosphate 25% and ground limestone 25% was before the cattle at all times and in addition salt alone was available. They were watered from an open trough—protected from freezing—twice daily at 10:00

Fig. No. 4—Calf from cow No. 14 by Red Poll sire. Photo taken following 7 months feeding at which time it weighed 464 lbs.

a.m. and 3:30 p.m. Shelter consisted of a frame shed partially open to the west with fair-sized exercising yards adjoining. Weights were recorded every 28 days.

Commencing with the third calf crop a change was made in handling the calves when they had reached the age of six to seven months. The reason for this was that beef cattle producers were being encouraged to market cattle at heavier weights in order to increase the supply of beef so urgently needed at that time. In addition it was decided that it was worthwhile exploring the possibility of reducing costs through the greater use of pasture and hay in the beef-making business. The revised plan, while somewhat flexible with a view to meeting market and feed conditions as they might arise during any season, was as follows: wintered on good quality hay (equal parts alfalfa and oat hay) plus two pounds of grain per head daily (oats 2, barley 1) and minerals fed with salt. The following summer they were grazed on brome-alfalfa pasture during the earlier part of the grass season and later on cover crop, without grain in both cases. Provided the animals lacked desirable finish when coming off cover crop they were placed in dry feed lot for a sufficient length of time to complete fattening. This included fairly heavy grain feeding. This procedure was followed for the third year. After coming off cover crop early in November they were carried in dry lot until January 4th of the following year.

The next year the cattle were placed on pasture May 22nd. Unfortunately, due to unfavorable weather conditions, sufficient pasture was not available on the University Farm in 1945 to provide suitable grazing. For this reason, with the exception of one October 1944 born calf, all were marketed directly off grass August 6th, 1945. At that time they showed a reasonable finish and sold as killing cattle.

The program during the fifth and last year was again somewhat different. Out of 10 head, seven showed sufficient finish when the grass pasture season ended and were marketed September 9th. The other three animals were moved to cover crop where they remained until November 5th when they were classed as finished cattle and sold immediately off cover crop. As usual, no grain was fed during the entire grazing season.

Presentation of Results

During the course of this experiment a vast amount of material in the form of records has piled up—too voluminous to include in a publication of this kind. The major interest developing out of the five years' study centers around the

outcome in terms of financial returns, both gross and net, derived from the two sources of revenue—dairy products and beef. Further, the complete story would be lacking without a submission of a reasonable amount of information relative to feed consumption.

This has been kept in mind in connection with the presentation of the results and the discussions that follow. In other words, the tables have been limited to those dealing with the features set out above. Other tables are included in the appendix, which offers an opportunity for further analysis in the event this is desired.

Dairy Production

The following table sets out the average results for the **cow herd.**

TABLE I

Alberta Milk and Butter Fat Production

No. cows in herd	16.
Total no. lactations	60

Dairy Production

Av. no. days in milk	301.2
Av. no. days dry	105.3
Av. milk production (on lactation basis)	6871.3 lbs.
Av. milk production (on yearly basis)	6166.8 lbs.
Av. butter fat production (on lactation basis)	287.9 lbs.
Av. butter fat production (on yearly basis)	258.4 lbs.

Discussion of Results

1. There was a total of 60 lactation periods for the herd of 16 cows during the five year period, or an average of 3.75 per cow. Three factors were responsible for this rather low figure. The prevalence of abortion in the herd was the main disturbing factor. Coupled with this the cows that were brought in as replacements to take the place of those sold as low producers did not enter the herd until the second year and, in addition, the breeding of a few of the cows was purposely delayed in order to have calves born as far as possible within a reasonably limited period. Only four cows out of the 16 included in this report completed five lactation periods. Seven completed four each, two three each and three only two full lactation periods. Keeping the above facts in mind this is a fair reproduction performance.

2. The average number of days in milk—301.2—is not far out of line for a milking herd. On the other hand, when considered with the number of days dry period—105.3 or 3½ months—it doesn't make too good a showing. The range in number of days in milk runs from a low of 182 to a high

of 483, while the number of days dry shows a range from 75 to 203. Here again abortion and delayed breeding were the disturbing factors.

3. The figures for both average milk and butter fat production are given on both lactation and yearly counts. Taken either way, the records are only fair. There is, however, a wide variation, running from a low of 4,038 lbs. milk for one cow (an average of two lactation periods) to a high of 10,269 lbs. milk for another cow (an average of three lactations). From the standpoint of butter fat the range is from 164.2 lbs. (an average of four lactation periods) to a high of 416.7 lbs. (an average of three lactation periods).

Beef Production

The details in connection with the **calf herd** are included in the table below.

TABLE II

Average Age and Weight of Calves When Sold

No. of calvings	60
Total no. of calves raised	46
Av. age when sold	448.5 days
Av. weight when sold	786.6 lbs.
Av. live wt. calculated on per cow per year basis	645.5 lbs.

Discussion of Results

1. A total of 46 calves raised, the outcome of 60 lactation periods, represents a low annual calf crop—between 76% and

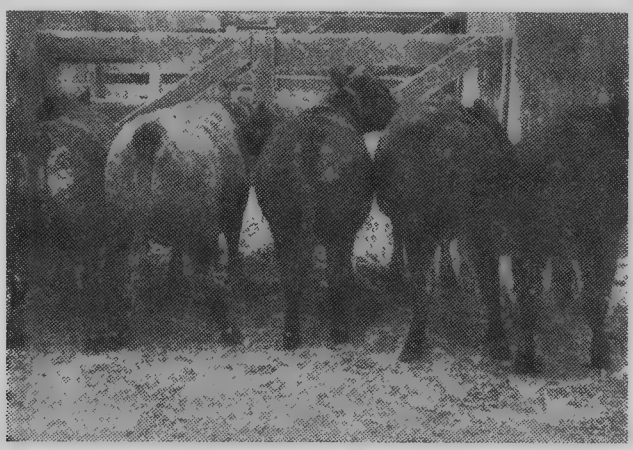

Fig. No. 5—Cross bred yearlings (Hereford sire) from dual purpose herd. Taken May, 1945, just previous to going to grass following a winter feeding period during which time they were maintained largely on hay together with a grain allowance of 2 lbs. per head daily. Average age, 390 days. Average weight, 648 pounds.

77%. Six abortions, together with the death of a total of eight calves account for this low figure. The abnormally high death rate occurred for the most part during one year—1943. Two were dead at birth, although not born prematurely. Another was born weak and survived only a few days. The following ailments—navel infection, bloat, scours, diptheria—accounted for four deaths, while another one was lost from undetermined causes.

2. The figures in Table II with respect to **average age** and **weight** when sold do not present an altogether representative picture. The procedure followed in handling the calves after skim milk feeding was discontinued varied somewhat. The first two years they were full fed grain and sold as finished cattle when approximately one year old. The succeeding years they were carried through the winter on a limited grain allowance, together with good quality roughage, pastured the following season and sold either off pasture or out of the feed lot following pasture when around 18 months of age.

3. Considering the 21 calves which were placed in the feed lot for fattening immediately following skim milk feeding, the average age marketed was 360.14 days at an average weight of 719.4 lbs. Calculated on the basis of per cow per year the figure would be 645.9 lbs. Including the remaining 25 head carried to an average age of 553.28 days their average selling weight was 843.8 lbs., or an average weight per cow per year of 757.7 lbs.

Feed Consumption

The average consumption of the different feeds used on both lactation and per year basis for the **cow herd** is submitted in the following table.

TABLE III

Average Feed Requirements for the Cow Herd

	Per lactation	Per year
Alfalfa hay	1513.8 lbs.	1358.6 lbs.
Non leguminous hay	1286.8 lbs.	1154.9 lbs.
Oat silage	6593.9 lbs.	5917.8 lbs.
Oats and barley mixture	1053.5 lbs.	945.5 lbs.
Bran	12.3 lbs.	11.0 lbs.
Pasture	176.7 days	158.6 days

Discussion of Results

1. On the average per year basis it required 1¼ tons of hay, approximately three tons of silage, 23 bushels of grain, a small amount of bran—11 lbs.—together with 158.6 days (approximately five months) pasture to maintain each cow in the herd. The relatively small amount of grain compared with the heavy consumption of roughages—hay, silage and

Fig. No. 6—Cross bred calves (Aberdeen Angus sire) from dual purpose herd when finished at an average age of 13 months, average weight 790 lbs., and sold for an average of $91.40 per head.

pasture—are significant features in connection with the maintenance of the herd.

2. The pasture for the most part consisted of a mixture of brome and alfalfa. During two different years in the progress of this investigation provision was made for fall pasture through the use of cover crop. From the standpoint of bulk it proved quite satisfactory. On the other hand, however, it did not sustain milk flow too well. While quite representative of the average cover crop, it appeared to be too soft and laxative for milking cows, resulting in abnormal looseness of the bowels. The addition of dry feed, either in the form of grain or roughages, proved advantageous.

3. Based on the conditions surrounding this five-year investigation it is estimated that from 3 to 3¼ acres of pasture will provide good grazing for approximately 5 months.

The following table presents the average feed consumption for the **calf herd.** This is given on the basis of per calf and per cow per year.

TABLE IV

Feed Requirements for the Calf Herd

	Per Calf	Calculated on per cow per year basis
Alfalfa hay	1117.1 lbs	916.7 lbs.
Non leguminous hay	793.8 lbs.	651.4 lbs.
Oats	905.2 lbs.	742.8 lbs.
Barley	621.1 lbs.	509.7 lbs.
Flax	128.1 lbs.	105.1 lbs.
Minerals	9.1 lbs.	7.5 lbs.
Pasture	168.7 lbs.	138.4 lbs.
Whole Milk	335.7 lbs.	275.5 lbs.
Skim Milk	2375.8 lbs.	1949.6 lbs.

Discussion of Results

1. The figures in the first column in the above table show the average feed consumption per calf marketed. Since the cows failed to produce an average of one calf per year, the feed consumption calculated on the basis of per cow per year would be as presented in the second column in Table IV.

2. Considered on the per calf basis it required approximately one ton of hay, between five and six months pasture, 40 bushels of grain, 2.3 bushels of flax together with 2711.5 lbs. of milk, of which close to 80% was skim milk, to raise a calf from birth up to marketing weight of an average of 786.6 lbs.

3. Keeping in mind the fact that during the course of this experiment the calf crop was marketed at different ages and weights, it is of interest to break the figures down with a view to comparing the relative amounts of the various feeds necessary to produce 100 lbs. gain.

4. Considering the 21 animals marketed at an average age of 360 days, finished in the feed lot immediately following skim milk feeding at a weight of 719.4 lbs. the average net return per head was $36.47.

On the other hand, including 25 animals carried to an average age of 553 days at an average weight of 843.8 lbs. before selling as finished cattle and utilizing more pasture and hay, the average net return per head was $37.04.

5. From the standpoint of feed requirements per 100 lbs. of gain the older cattle consumed 145 lbs. more hay and utilized more pasture but required 142 lbs. less grain. Marketing at more advanced ages and heavier weights, while showing very little difference in net returns per animal, showed some worthwhile advantage from the point of view of providing an outlet for the cheaper, bulkier feeds.

Financial Statement

Table V below sets out the financial returns.

TABLE V

Average Gross and Net Revenue, Including Both Milk and Beef

Av. per year gross income from dairy products	$108.07
Av. total feed costs to produce dairy products	42.75
Av. net income over feed costs from dairy products	65.32
Av. per year gross income from beef	71.26
Av. total feed costs to produce beef	41.37
Av. net income over feed costs from beef	29.89
Av. gross income from dairy products and beef combined	179.33
Av. net income over feed costs from dairy products and beef combined	95.21

The financial statement is based on the following prices:

Av. for first grade churning cream	37.06 cents.
Av. for whole milk	$1.75 per cwt.
Av. for skim milk	22.5c per cwt.
Av. of beef	$11.04 per cwt. live weight
Alfalfa hay	$14.00 per ton
Oat hay	9.80 per ton
Bran	25.00 per ton
Oat silage	3.00 per ton
Pasture	1.25 per head per month
Oats	.46 per bushel
Barley	.56 per bushel
Flax meal	3.62 per cwt.
Salt	1.24 per cwt.
Minerals	1.97 per cwt.

Summary

An investigation covering a five year period was undertaken in 1941 with a herd of commercial dual purpose cows, the object being to determine what this type of cattle production had to offer from the standpoint of financial returns from the sale of dairy products and beef, as well as a medium for the marketing of farm grown feeds, more especially hay and pasture crops. The herd was fairly representative of this class of cattle and included 10 Shorthorn and 6 Red Poll cows. The calves were sired by good beef bulls, skim milk fed up to an age of between six and seven months and marketed as finished cattle. The first two years they were fattened in feed lot immediately following the termination of milk feeding and sold at approximately one year of age. The succeeding calf crops were sold as older cattle at heavier weights following a winter in dry lot, limited grain feeding and finished on pasture, including cover crop, and if found necessary, both to dry lot for final finishing.

1. The total number of lactation periods, including the 16 cow herd, was 60. The total number of calves marketed was 46. Three factors were responsible for this poor showing: (1) The prevalence of abortion. (2) The abnormal death rate in the calves. (3) The fact that in a few cases where cows calved late in the season breeding was delayed in order to bring the next freshening more in line with the other cows in the herd. The result was that the annual calf crop was low —between 76% and 77%.

2. The average yearly milk production was 6166.8 lbs. The average yearly butter fat production was 258.4 lbs. Abortion with its aftermath again was a contributing factor for the somewhat low production figures.

3. The calves were marketed as finished cattle at an average of 448.5 days, an average weight of 786.6 lbs.: if calculated

on a per cow per year basis this would represent 645.5 lbs. beef produced.

4. The average yearly feed consumption for the cow herd was 1¼ tons hay, approximately 3 tons silage, 23 bushels grain with an additional 11 lbs. bran and approximately 5½ months' pasture.

5. The average feed consumption in the case of the calves was approximately 1 ton hay, between 5 and 6 months' pasture, 40 bushels grain with the addition of 2.3 bushels of flax, 2711.5 lbs. milk of which ⅞ was skim milk.

6. Based on the prevailing price of **dairy products, beef** and **feeds** during the course of this experiment, the average gross return from dairy products was $108.07 with an average feed cost per year of $42.75. The average net return for dairy products was $65.32.

7. The average yearly gross return from beef was $71.26 while the average feed costs amounted to $41.37, leaving an average net return of $28.89.

8. Considering both dairy products and beef the average gross return was $179.33 and the average net return was $95.21.

9. On the basis of gross income dairy products accounted for around 60% of the total; considered on the basis of net income it was higher—close to 69%.

10. Selling the calf crop as finished cattle when from 18 to 20 months of age compared to finishing in dry lot immediately following milk feeding resulted in a slightly greater profit per head and the utilization of more pasture and hay.

Conclusions

1. In spite of the prevalence of abortion together with a relatively low calf crop this herd of dual purpose cows made a fairly satisfactory showing.

2. While an average milk yield of a little over 6000 lbs. and an average butter fat record of close to 260 lbs. is not particularly high, when considered, however, in the light of the range in production from a low of 4038 lbs. to a high of 10269 lbs. for milk and a low of 164.2 lbs. to a high of 416.7 lbs. for butter fat, it suggests the possibility of increasing average production with dual purpose cattle by breeding and selection.

3. An average selling weight for the calves of approximately 790 lbs. and an average age of around 450 days compares favorably with calves of strictly beef breeding.

4. Acceptable feeder calves were produced when dual purpose cows were mated with good type beef bulls. Fed on skim milk, supplemented with farm grown feeds, including flax, they attained an average weight of 348 lbs. when between six and seven months of age.

5. The fact that the net returns from the sale of dairy products constituted approximately 70% of the total returns from the dual purpose herd emphasizes the importance of stressing reasonably high milk production in this class of cattle.

6. While the average yearly net return from beef production is considerably lower than that from dairy production it does represent an added substantial revenue from a herd of dual purpose cattle.

7. An average yearly total gross income (including milk and beef) amounting to within a few cents of $180.00 from a cattle production program, which on the ordinary farm may be considered only one of a group of farm enterprises, suggests that a herd of dual purpose cows has something to offer in certain areas of this province where specialization is not practised.

8. This type of cattle production lends itself to the liberal use of pasture and hay and this in turn provides for a farm cropping system which links up well with a soil conservation program.

APPENDIX "A"

DUAL PURPOSE CATTLE EXPERIMENT—SUMMARY OF COW HERD

Cow Number	1—Shorthorn	2—Shorthorn	4—Shorthorn	5—Shorthorn	6—Shorthorn	7—Shorthorn	8—Shorthorn	10—Shorthorn	11—Shorthorn	12—Shorthorn	14—Red Poll	15—Red Poll	16—Red Poll	17—Red Poll	18—Red Poll	19—Red Poll	Total	Average	Average per cow on yearly basis
No. of lactations	4	4	2	2	4	4	4	5	5	5	4	5	3	4	2	3	60	3.75	
Av. milk production (lbs.)	8,575	8,809	8,449	4,038	8,281	4,108	4,136	5,501	5,666	7,273	7,270	6,967	10,269	7,174	5,802	7,623	109,941	6,871.3	6,166.8
Av. b.f. production (lbs.)	347.7	355.8	331.0	171.5	329.5	178.0	164.2	212.8	216.9	298.5	314.9	312.9	416.7	346.9	277.1	331.4	4,605.8	287.9	258.4
Av. length of lactation (days)	320.5	322	337	276	272	182	228	244	225	284	339	257	483	318	398	334	4,819.5	301.2	270.3
Av. length of dry period (days)	92	115	84	.	77	203	129	144	128	105	106	113	75	108	45	62	1,586	105.8	94.9
Av. value dairy products sold	$137.17	$142.83	$134.74	$73.57	$149.61	$69.74	$65.09	$89.60	$89.92	$129.15	$128.48	$130.10	$191.43	$143.17	$114.80	$137.28	$1,926.68	$120.42	$108.07
Av. feed consumed—lactation and dry period (lbs.):																			
Alfalfa	2,289	2,076	1,690	1,108	1,510	1,189	1,089	1,543	742	1,113	1,598	1,074	2,528	1,979	1,280	1,413	24,221	1,513.8	1,358.6
Non-leguminous hay	1,143	1,052	1,178	586	843	1,283	912	951	1,277	1,309	1,784	1,496	2,125	1,898	1,203	1,549	20,589	1,286.8	1,154.9
Silage	6,796	6,774	7,095	4,469	6,163	6,107	5,541	6,585	5,982	6,425	7,502	6,457	8,559	7,606	6,353	7,089	105,503	6,593.9	5,917.8
Grain	1,369	1,269	1,168	712	1,006	500	546	805	769	1,010	1,239	927	1,670	1,320	999	1,547	16,856	10,535	945.5
Bran	13	2	.	.	19	27	16	9	11	7	20	9	7	10	.	10	160	12.3	11.0
Pasture (days)	168	191	160	128	155	160	161	176	162	168	197	158	246	178	228	191	2,827	176.7	158.6
Av. total feed cost, including pasture	$53.31	$52.35	$50.07	$34.59	$44.39	$34.03	$33.99	$43.04	$38.76	$43.71	$53.64	$44.66	$73.97	$56.89	$51.18	$53.63	$762.21	$47.64	$42.75
Av. profit over feed cost	$83.86	$90.48	$84.67	$38.98	$105.22	$35.71	$31.10	$46.56	$51.16	$85.44	$74.84	$85.44	$117.46	$86.28	$63.62	$83.65	$1,164.47	$72.78	$65.32

APPENDIX "B"

DUAL PURPOSE EXPERIMENT—CALF SUMMARY

Cow Number	1—Shorthorn	2—Shorthorn	4—Shorthorn	5—Shorthorn	6—Shorthorn	7—Shorthorn	8—Shorthorn	10—Shorthorn	11—Shorthorn	12—Shorthorn	14—Red Poll	15—Red Poll	16—Red Poll	17—Red Poll	18—Red Poll	19—Red Poll	Total	Average per cow	Average per cow on yearly basis
No. lactations	4	4	2	2	4	4	4	5	5	5	4	5	3	4	2	3	60	3.75	....
No. calves raised	3	4	2	0	3	4	2	4	5	5	4	3	1	2	1	3	46	2.875	....
Av. age marketed (days)	492	440	498	....	467	414	424	413	509	498	449	566	375	335	392	400	6,672	444.8	365
Av. wt. marketed (lbs.)	804	810	920	....	823	731	744	717	799	835	818	796	728	705	767	802	11,799	786.6	645.5
Av. price per cwt.	$10.08	$10.51	$10.90	....	$11.49	$10.77	$11.27	$11.14	$10.92	$11.09	$10.12	$11.10	$11.56	$10.83	$12.15	$11.67	$165.60	$11.04	$9.06
Ave. value per head	$81.26	$87.12	$100.10	....	$94.57	$78.63	$83.62	$79.87	$87.61	$92.78	$83.23	$88.74	$84.16	$75.78	$93.19	$91.84	$1,302.50	$86.84	$71.26
Feed consumed:																			
Whole milk (lbs.)	343	376	476	....	307	326	348	321	317	305	366	340	353	265	276	317	5,036	335.7	275.5
Skim milk (lbs.)	2,452	2,371	2,385	....	2,173	2,515	2,308	2,365	2,271	2,474	2,481	2,508	2,205	2,539	2,208	2,382	35,637	2,375.8	1,949.6
Alfalfa (lbs.)	1,111	995	756	....	1,389	1,316	1,252	1,119	1,357	1,414	1,195	1,387	713	649	897	1,206	16,756	1,117.1	916.7
Non-leguminous hay (lbs.)	1,212	985	1,769	....	400	490	894	701	753	622	947	849	665	349	671	660	11,907	793.8	651.4
Oats (lbs.)	792	824	972	....	1,602	771	814	754	790	846	802	732	910	886	1,252	832	13,579	905.2	742.8
Barley (lbs.)	474	540	734	....	467	493	414	568	475	492	560	493	811	935	1,136	724	9,316	621.1	509.7
Flax (lbs.)	71	102	58	....	104	112	95	118	100	106	121	90	198	214	273	160	1,922	128.1	105.1
Pasture (days)	234	195	238	....	182	141	192	179	206	103	171	140	182	107	154	107	2,531	168.7	138.4
Salt (lbs.)	13.2	10.3	9.9	....	11.1	8.2	11.78	8.6	10.9	10.8	8.5	10.0	7.3	6.0	9.6	14.2	150.4	10.0	8.2
Limestone (lbs.)	7.0	6.8	8.2	....	10.0	6.9	6.0	8.6	10.6	9.3	9.4	11.0	7.2	15.8	9.1	10.8	136.7	9.1	7.5
Av. cost of feed	$52.15	$50.26	$58.06	....	$62.14	$45.54	$48.28	$47.50	$49.94	$48.67	$50.66	$49.48	$46.47	$41.49	$56.98	$48.67	$756.29	$50.42	$41.37
Av. profit over feed cost	$29.11	$36.86	$42.04	....	$32.43	$33.09	$35.34	$32.37	$37.67	$44.11	$32.57	$39.26	$37.69	$34.29	$36.21	$43.17	$546.21	$36.42	$29.89